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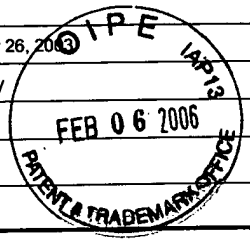
TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/670,531
Filing Date	September 26, 2003
First Named Inventor	Castleberry
Art Unit	3643
Examiner Name	Gellner
Attorney Docket Number	X-9425



ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
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  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☑ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☑ Other Enclosure(s) (please Identify below):

Remarks

Response and Corrected Appeal Brief and two copies

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	GIPPLE & HALE		
Signature			
Printed name	John S. Hale		
Date	February 6, 2006	Reg. No.	25,209

CERTIFICATE OF TRANSMISSION/MAILING

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Typed or printed name		Date	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	
CASTLEBERRY	
Serial No.: 10/670,531	Examiner Gellner
Filed: September 26, 2003	Group Art Unit 3643
For: AGRICULTURAL FOAM GROWING MATERIAL	

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE

In response to the Notification of Non-Compliant Appeal Brief dated January 4, 2006, Applicant hereby submits a corrected Appeal Brief and two copies.

Respectfully submitted,

GIPPLE & HALE

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	:	
CASTLEBERRY	:	
Serial No.: 10/670,531	:	Examiner Gellner
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For: AGRICULTURAL FOAM GROWING MATERIAL	:	

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF

REAL PARTY IN INTEREST

The real party in interest is the appellant, Wayne Castleberry.

RELATED APPEALS AND INTERFERENCES

There are no other appeals, interferences or judicial proceedings known to appellant or it's legal representatives which may be related to, directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

STATUS OF THE CLAIMS

Claims 1-15 are rejected under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672. Claims 16-23, 25 and 26 have been rejected under 35 USC 103(a) as unpatentable over the publication of US Rubinate/Suprasec in view of Pruitt '441 patent. Claims 1-23, 25 and 26 are being appealed.

STATUS OF THE AMENDMENTS

The Examiner issued a final rejection on March 4, 2005 rejecting the claims currently in the case. A Response was made after the final rejection presenting arguments as to why the combined cited references were not valid prior art. This response was refused entry as not being deemed to place the application in better form for appeal by materially reducing or simplifying the issue on appeal.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The subject matter of independent claim 1 is directed toward a horticultural growing medium made of a diphenylmethane diisocyanate flexible foam material without filler material (p. 6, lns. 4, 5) having a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2, 3) capable of supporting plant growth (p. 8, lns. 4-10).

The subject matter of dependent claim 3 (depending from claim 1) is directed toward a foam material taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate.

In dependent claim 6 (depending from claim 1), the foam material has a neutral pH ranging

from 6.8 to 7.8 (p. 7, ln. 1).

In dependent claim 8 (depending from claim 1), the foam material has at least 50% of its pores by foam volume ranging in size between 10 and 200 microns (p. 7, lns 15, 16).

In dependent claim 10 (depending from claim 1), the foam material has pores ranging from 20% to about 25% by foam volume which range in size between about 0.2 microns to about 10 microns (p. 7, lns. 18-20).

In dependent claim 11 (depending from claim 1), the foam material has pores ranging from about 25% to about 35% by foam volume which range in size between about 300 microns to about 800 microns (p. 7, lns. 21, 22).

In dependent claim 14 (depending from claim 1), the foam material has a total porosity ranging from 85% to 95% (p. 7, ln. 4).

The subject matter of independent claim 16 is directed toward a sterile hydrophilic unfilled foam material (p. 6, ln. 22; p. 7, ln. 1) made of diphenylmethane diisocyanate (p. 6, lns. 12-15) having at least 50% of its pores ranging in size between 10 and 200 microns (p. 7, lns. 15, 16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-4), with a total porosity ranging from about 85% to about 95% (p. 7, ln. 4) and being capable of supporting plant growth (pg. 8, lns. 4-10).

The subject matter of independent claim 20 is directed toward a horticultural growing medium formed by a substantially sterile unfilled foam material (p. 6, lns. 22; p. 7, ln. 1) made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same (p. 6, lns. 12-15), having at least 50 of

its pores ranging in size between 10 and 200 microns (p. 7, lns. 15, 16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-4), with a total porosity ranging from about 90% to about 92% (p. 7, lns. 4, 5) and being capable of supporting plant growth (pg. 8, lns. 4-10).

The subject matter of dependent claim 21 (depending on independent claim 20) is a foam material constructed in the form of a sheet with seeds secured thereto (p. 9, ln. 4 & Figure 5).

The subject matter of independent claim 25 is similar to that of claim 20 with the foam material including a similar group of diphenylmethane diisocyanate and having a pH ranging from 6.8 to 7.8 (p. 7, ln. 1).

The subject matter of independent claim 26 is directed toward a horticultural growing medium formed by a substantially sterile unfilled foam material (p. 6, lns. 22; p. 7, ln. 1) made of polymeric diphenylmethane diisocyanate taken from a group consisting of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI (p. 6, lns. 12-15), having at least 50 of its pores by foam volume ranging in size between 10 and 200 microns (p. 7, lns. 15, 16) with a cation exchange capacity ranging from about 1.0 to about 1.5 (p. 8, lns. 2-4), with a total porosity ranging from about 85% to about 95% (p. 7, lns. 4) and being capable of supporting plant growth (pg. 8, lns. 4-10).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

(1) Whether the invention as defined in Claims 1-15 is unpatentable under 35 USC 103(a) over the cited prior art references to Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672.

(2) Whether the invention as defined in Claims 16-23, 25 is unpatentable under 35 USC 103(a) over the cited prior art references US Rubinate/Suprasec publication in view of Pruitt U.S.

Patent Number 2,988,441.

ARGUMENT

The claims should be generally grouped into two groups, Group I comprising Claims 1-15 directed toward a horticultural growing medium capable of supporting plant growth constructed of a flexible diphenylmethane diisocyanate (MDI) foam material with a cation exchange capacity (C.E.C.) ranging from about 1.0 to about 1.5 milliequivalents (meg)/100 g with separate dependent claims 6, 8, 10, 11 and 14 directed toward pore size and porosity and Group II comprising claims 16-23, 25 and 26 directed towards a horticultural growing medium capable of supporting plant growth comprising a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50% of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5 and a total porosity ranging from about 85% to about 95%. Claim 21 is directed toward a sheet of the claimed material with seeds attached.

(A) The Examiner's rejection of Claims 1-15 under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672 is not correct and should be reversed.

Claims 1-15 are directed toward a horticultural growing medium capable of supporting plant growth in the form of a diphenylmethane diisocyanate unfilled foam material having a cation

exchange capacity (C.E.C.) ranging from about 1.0 to about 1.5 milliequivalents (meg)/100 g. The material has pore sizes of various ranges in various percentages and a total porosity ranging from 85% to 95%.

The Garrett '672 reference is directed toward a soil additive using a foam having a bulk density of approximately 1 pound per cubic foot. This reference can be dismissed in its entirety as it is directed to ureaformaldehyde foam. As noted on Col 4 lns 59-63: "Generally, the present invention is directed to a plant growth media comprising a ureaformaldehyde foam that can be used to control the growth rate of the plants or to decrease the growth rate of the plants" The foam in powdered form is added to a soil formulation such as natural soils, potting soil, peatlite, vermiculite, peat moss and mixtures thereof. There is filler material in the foam (carbohydrates additives), under any interpretation of the specification, either in powder form mixed with soil or as a hydroponics block. It is readily understood by one of ordinary skill in the art that **ureaformaldehyde foam is made from reacting formaldehyde and urea and is totally different in composition and structure in relation to the unique foam of the present invention**.

Furthermore as noted in Col. 5 lns. 19 26 "In a preferred embodiment of the present invention, the ureaformaldehyde foam used is a foam marketed under the trade name PLASTSOIL, which can be obtained from Coverfoam Services, Inc. Located in Florance, S.C. PLASTSOIL, which is a predominantly open celled hydrophilic foam, has **an appearance similar to that of "cotton candy" and has a bulk density of approximately 1 pound per cubic foot."** The present inventive foam is totally different in structure.

Garrett '672 also does not show any cation exchange capacity (hereinafter C.E.C.) for the material, relying upon the organic composition (filler) of the mixture and the carbohydrate additives

to provide same. PLASTSOIL is a cellular plastic composition made from reacting formaldehyde and urea in particular concentration unique to PLASTSOIL, and carbohydrates such as glucose, fructose, malose and sucrose can be incorporated into the foam (col. 5, lns. 34-49) * * * **Although unknown, it is possible that the unexpected results achieved by the process of the present invention (Garrett '672) are attributable to the carbohydrate additives.** (Col. 5, lns. 46-49).

Where used in the process of the present invention, PLASTSOIL is broken down and used in powdered form. (Col. 5, lns. 55-57).

When using the ureaformaldehyde foam in accordance with the '672 teaching, the foam in powdered form is preferably mixed with a conventional soil formulation and used as a plant growth medium. The foam can be added to a soil formulation in amounts from about 5% to 90% by volume depending upon the circumstances and results desired (col. 5, lns. 58-66). It should be noted that ureaformaldehyde foam has a residue (ppm) of formaldehyde remaining in the foam material. Garrett '672 does not teach pore size or porosity, C.E.C., the use of foam without a filler or a sterile foam.

The Pruitt '441 reference is directed towards a medium for the growth and propagation of potted plants using polyurethane, rubber and vinyl resins having added synthetic ion exchange resins to produce an open celled foam. It is an object of the invention to provide a nutrient containing foamed matrix, an MDI based foam. As noted in Col 2 lns. 17-24 "It has been discovered that when polymeric materials which are foamable to form a stable open-celled foam structure are mixed with plant nutrients in chemical combination with a water-insoluble ion exchange resin and thereafter foamed, stable synthetic water-insoluble foamed product results which provides a unitary plant growing medium for intensive plant culture." The term plant nutrients is defined to mean calcium,

nitrogen, phosphorous, sulfur, potassium and magnesium. The invention also embraces the additions of micronutrients; boron, manganese, iron, zinc, molybdenum and copper which are necessary for intensive plant growth. These nutrients are supplied in chemical concentrations with water insoluble synthetic ion exchange resins. As further noted on Col 2. Lns 51 - 55 "The invention is particularly concerned with a matrix prepared from the three major classes of resins known to produce open celled foam structure, namely, the polyurethanes, the rubbers and the vinyl foams, * * * ." Garnett does not use any of these three classes of foams.

As noted on col. 5, lns. 24-31, "The preferred foam matrix according to the present invention (the '441 patent) is a polyurethane or modified polyurethane foam **matrix** wherein a polyester or polyether resin, diisocyanate, nutrient charged ion exchange resin, modifying agent (if employed) and a foaming catalyst comprising a water-catalyst mixture are reacted together according to any of the three foam-producing methods or modifications thereof."

It would not be obvious to one of ordinary skill in the art at the time of the present invention to modify the medium of Pruitt '441 by eliminating the filler because **unfilled polyurethane foam is not hydrophilic nor does it have a C.E.C. of from 1.0 to 1.5.** To overcome an inherently poor C.E.C., Pruitt adds a synthetic anion exchange resin (col. 13, lns. 57-75) and adds an inert compound having a high water-holding capacity in order to render the matrix hydrophilic (See example 1).

In the present invention it was unexpected that the invented foam formulation would produce a hydrophilic foam with a C.E.C. of from 1.0 to 1.5. As previously noted, **Pruitt '441 is directed toward filled foams.** Pruitt '441 does not work without a filler; if it did, such would have been disclosed. Sterility is not inherent to filled foams nor is there any mention of sterility in Pruitt '441.

Since the present invention does not introduce any fillers to the matrix, there is less possibility to contaminate the matrix and render it un-sterile. Sterile materials conform to Agricultural requirements currently in place thus making it easier to ship plants and the media materials across national borders. Neither cited reference is an unfilled foam material with a C.E.C. ranging from 1.0 to 1.5, with sterility which has been previously noted as a necessary requirement when shipping plants internationally or has optimum pore sizes and porosity for fluid transfer to the plant. It may be obvious to one of ordinary skill in the art that air water ratios can be altered with the addition of fillers, but it is not obvious how to obtain air water ratios without the use of fillers. When one puts additives in foam, pore size is exceptionally difficult to control. Those skilled in the art would know that fact. Thus pore size is not inherent. Furthermore, the chemical reactions that take place in filled foam are such that sterility is not inherent in filled foams.

As previously noted the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties and the pH range of the present invention is not taught.

One of ordinary skill in the art would realize that polyurethane foam cannot be made without an isocyanate being one of the ingredients. The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

The invention of Pruitt is based on the additions of ion exchange additives. It is not obvious to one of ordinary skill in the art that polymeric diphenylmethane diisocyanate would impart the unique properties to the unfilled foam of the present invention.

Although Pruitt '441 discloses 4,4'-methylenebis(phenyl isocyanate), the use of this material in his invention of filled polyurethane foam would not produce a foam matrix with the unexpected unique properties of the present invention of a non-filled foam. Pruitt '441 does not disclose a

C.E.C. ranging from 1.0 to 1.5 and is directed toward a filled foam. There is no showing that if the foams were modified by Pruitt '441 that it would have a 1.0 to 1.5 C.E.C. C.E.C. is not predictable as it depends upon the structure of molecules that make the foam. Different ingredients in making foam will give different C.E.C. Density also changes the C.E.C. as do the foaming ingredients and the thousands of variables of additives, each with a different C.E.C.

Pruitt (US 2,988,441) and Garrett (US 5,617,672),disclose in the prior art various growth media of foams, which **use filler in the growth media because un-filled polyurethane foam was not believed to be a suitable growth media. It was unexpected to discover that the un-filled polyurethane foam of the present invention has the required properties of a suitable growth media, pH, porosity, pore size, C.E.C. ranges and foam material.**

In cases which are similar to the present circumstances, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem.,* 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id. As noted by the court in the case of *In re Clinton,* "Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary." *In re Clinton,* 527 F.2d 1226, 1228, 188 U.S.P.Q. 365, 367 (C.C.P.A.1976).

As noted by the Court in the case of *In re Gordon,* the mere fact that a prior art reference could be modified to achieve the claimed invention does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon,* 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir.1984); see also *In re Laskowski,* 871 F.2d 115, 117, 10 U.S.P.Q.2d

1397, 1398 (Fed. Cir. 1989), and *Ex parte Levengood,* 28 U.S.P.Q.2d 1300, 1302 (Bd. Pat. App. & Int. 1993). Applicants respectfully submit that nowhere in the art of record is there any suggestion to arrive at the claimed novel composition of the present invention.

The court in *Minnesota Mining & Manufacturing Co. v. Johnson &Johnson Orthopaedics, Inc.*, 24 USPQ2d 1321 (Fed. Cir 1992) held that: "Although [a patent's] specific claims are subsumed in [a prior art reference's] generalized disclosure..., this is not literal identity." The *Minnesota* court held that the reference's ranges were so broad as to be meaningless, and provided no guidance on how to construct a product with the patented invention's benefits. The court in *In re Baird,* 29 USPQ2d 1550 (Fed. Cir. 1994), held that "The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." The *Baird* court further held that a disclosure to numerous compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.

As previously argued, none of the cited references singularly or in combination suggest teach or obviate the present invention and indeed cannot be combined. The Examiner has engaged in hindsight application, a prohibited rejection since *John Deere* to combine the cited prior art references against the present invention.

(B) The Examiner's rejection of dependent claims 6, 8, 10, 11 and 14 under 35 USC 103(a) as unpatentable over Pruitt U.S. Patent Number 2,988,441 in view of Garrett U.S. Patent Number 5,617,672 is not correct and should be reversed.

The above noted claims are limited to pore size and porosity. When using the

ureaformaldehyde foam in accordance with the '672 patent, the foam in powdered form is preferably mixed with a conventional soil formulation and used as a plant growth medium. The foam can be added to a soil formulation in amounts from about 5% to 90% by volume depending upon the circumstances and results desired (col. 5, lns. 58-66). It should be noted that ureaformaldehyde foam has a residue (ppm) of formaldehyde remaining in the foam material. Garrett '672 does not teach pore size or porosity, C.E.C., the use of foam without a filler or a sterile foam.

It may be obvious to one of ordinary skill in the art that air water ratios can be altered with the addition of fillers, but it is not obvious how to obtain air water ratios without the use of fillers. The present invention uses optimum pore size for fluid transfer to the plant. When one puts additives in foam, pore size is exceptionally difficult to control. Those skilled in the art would know that fact. Thus pore size is not inherent.

As previously noted the claim of pore size and porosity in the present invention is a further description of the unique unfilled foam with unexpected properties.

Pruitt '441 is directed to filled foam and therefore does not disclose or teach porosity.

(C) The Examiner's rejection of dependent claims 16-23, 25 and 26 under 35 USC 103(a) as unpatentable over the US Rubinate/Suprasec publication in view of Pruitt '441 is not correct and should be reversed.

Claims 16-23, 25 and 26 are directed toward a horticultural growing medium capable of supporting plant growth in the form of a substantially sterile unfilled foam material made of diphenylmethane diisocyanate which can be taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50% of its pores by foam

volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5 and a total porosity ranging from between about 85% to about 95%

The Rubinate/Suprasec publication reference only represents a list of isocyanates supplied by Huntsman and does not disclose **a sterile foam or that the foam can be used for plant growth, or that the foam has specific porosity, pore size, pH or C.E.C.** This reference is simply a list showing isocynates supplied by Huntsman, the raw chemical material of various foams, which chemicals are poisonous. Rubinate/Suprasec doe not teach the inventive foam. **It should be noted that methyl isocynate is the chemical which leaked from a tank at the UCIL Bhopal plant, killed thousands of people and injured additional thousands in Bhopal, India.** There is no showing that diphenylmethane diisocyanates is a medium capable of supporting plant growth. MDI is a poisonous liquid and will not support plant growth.

The Pruitt '441 reference is directed towards a medium for the growth and propagation of potted plants using polyurethane, rubber and vinyl resins having added synthetic ion exchange resins to produce an open celled foam. It is an object of the invention to provide a nutrient containing foamed matrix, an MDI based foam. As noted in Col 2 lns. 17-24 "It has been discovered that when polymeric materials which are foamable to form a stable open-celled foam structure are mixed with plant nutrients in chemical combination with a water-insoluble ion exchange resin and thereafter foamed, stable synthetic water-insoluble foamed product results which provides a unitary plant growing medium for intensive plant culture." The term "plant nutrients " is defined to mean calcium, nitrogen, phosphorous, sulfur, potassium and magnesium. The '441 reference also embraces the additions of micronutrients; boron, manganese, iron, zinc, molybdenum and copper which are necessary for intensive plant growth. These nutrients are supplied in chemical

concentrations with water insoluble synthetic ion exchange resins. As further noted on Col 2. Lns 51 - 55 "The invention is particularly concerned with a matrix prepared from the three major classes of resins known to produce open celled foam structure, namely, the polyurethanes, the rubbers and the vinyl foams, * * * ." Garnett does not use any of these three classes of foams.

As noted on col. 5, lns. 24-31, of the '441 reference "The preferred foam matrix according to the present invention is a polyurethane or modified polyurethane foam matrix wherein a polyester or polyether resin, diisocyanate, nutrient charged ion exchange resin, modifying agent (if employed) and a foaming catalyst comprising a water-catalyst mixture are reacted together according to any of the three foam-producing methods or modifications thereof."

It would not be obvious to one of ordinary skill in the art at the time of the invention to modify the medium of Pruitt '441 by eliminating the filler because **unfilled polyurethane foam is not hydrophilic nor does it have a C.E.C. of from 1.0 to 1.5.** To overcome an inherently poor C.E.C., Pruitt adds a synthetic anion exchange resin (col. 13, lns. 57-75) and adds an inert compound having a high water-holding capacity in order to render the matrix hydrophilic (See example 1).

In the present invention it was unexpected that the invented foam formulation would produce a hydrophilic foam with a C.E.C. of from 1.0 to 1.5. As previously noted, **Pruitt '441 is directed toward filled foams.** Pruitt '441 does not work without a filler; if it did, such would have been disclosed. Sterility is not inherent to filled foams nor is there any mention of sterility in Pruitt '441. Since the present invention does not introduce any fillers to the matrix, there is less possibility to contaminate the matrix and render it un-sterile. Sterile materials conform to agricultural requirements currently in place thus making it easier to ship plants and the media materials across national

borders. Neither reference is a foam material with a C.E.C. ranging from 1.0 to 1.5, with sterility which has been previously noted as a necessary requirement when shipping plants internationally or optimum pore sizes for fluid transfer to the plant. It may be obvious to one of ordinary skill in the art that air water ratios can be altered with the addition of fillers, but it is not obvious how to obtain air water ratios without the use of fillers. When one puts additives in foam, pore size is exceptionally difficult to control. Those skilled in the art would know that fact. Thus pore size is not inherent. Furthermore chemical reactions that take place in filled foam are such that sterility is not inherent in filled foams.

As previously noted the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties.

One of ordinary skill in the art would realize that polyurethane foam cannot be made without an isocyanate being one of the ingredients. The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

The invention of Pruitt is based on the additions of ion exchange additives. It is not obvious to one of ordinary skill in the art that polymeric diphenylmethane diisocyanate would impart the unique properties to the unfilled foam of the present invention.

Although Pruitt '441 discloses 4,4'-methylenebis(phenyl isocyanate), the use of this material in his invention of filled polyurethane foam would not produce a foam matrix with the unexpected unique properties of the present invention of a non-filled foam. Pruitt '441 does not disclose a C.E.C. ranging from 1.0 to 1.5 and is directed toward a filled foam. There is no showing that if the foams were modified by Pruitt '441 that it would have a 1.0 to 1.5 C.E.C. C.E.C. is not predictable as it depends upon the structure of molecules that make the foam. Different ingredients in making

foam will give different C.E.C. Density also changes the C.E.C. as do the foaming ingredients and the thousands of variables of additives, each with a different C.E.C.

Pruitt (US 2,988,441) discloses in the prior art various growth media of foams, which **use filler in the growth media because un-filled polyurethane foam was not believed to be a suitable growth media. Rubinate/Suprasec is simply a raw chemical list for chemicals which can be used in foam products. It was unexpected to discover that the un-filled foam of the present invention has the required properties of a suitable growth media, specific porosity, pH, pore size, C.E.C. ranges and foam material.**

As previously noted, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem., supra.*, "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id.

The previous discussion of *In re Gordon, supra.* and *Minnesota Mining & Manufacturing Co. v. Johnson &Johnson Orthopaedics, Inc., supra.,* also apply to this rejection.

Applicants respectfully submit that nowhere in the art of record is there any suggestion or combination to arrive at the claimed novel composition of the present invention.

(D) The Examiner's rejection of dependent claim 21 under 35 USC 103(a) as unpatentable over the US Rubinate/Suprasec publication in view of Pruitt '441 is not correct and should be reversed.

There is no teaching is Pruitt '441 nor the Rubinate publication of a sheet of a growing medium sheet in the form of a sheet of material of the composition claimed with plant seeds secured thereto.

As previously argued, none of the cited references singularly or in combination suggest, teach or obviate the present invention and indeed cannot be combined. The Examiner has engaged in hindsight application, a prohibited rejection since *John Deere* to combine the cited prior art references against the present invention.

The respective grounds of final rejection of the claims of this application under 35 USC 103(a) are incorrect for the reasons advanced above. Reversal thereof by the Honorable Board of Patent Appeals and Interferences is therefore requested and is earnestly solicited.

Our check in the amount of $250.00 was previously attached to cover the cost of filing this Brief and two copies. Oral hearing will be requested during the rebuttal time period. If any additional fees are incurred, kindly charge the same to our Deposit Account No. 07-1340.

Respectfully submitted,

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CLAIMS APPENDIX

1. A horticultural growing medium comprising:

a flexible diphenylmethane diisocyanate foam material without filler material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

2. The horticultural growing medium of claim 1, wherein said cation exchange capacity is about 1.25.

3. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate.

4. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is polymeric diphenylmethane diisocyanate.

5. The horticultural growing medium of claim 1, wherein said diphenylmethane diisocyanate foam material is one or a mixture of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), polymeric MDI, crude MDI, namely, products of crude diaminodiphenyl methane or a mixture of the same

6. The horticultural growing medium of claim 1, wherein said foam material has a neutral pH ranging from 6.8 to 7.8.

7. The horticultural growing medium of claim 1, wherein said foam material is highly porous and maintains a 60 to 40 air to water ratio.

8. The horticultural growing medium of claim 1, wherein said foam material has at least 50% of its pores by foam volume ranging in size between 10 and 200 microns.

9. The horticultural growing medium of claim 1, wherein said foam material has about 50%

of its pores by foam volume ranging in size from 40 to about 90 microns.

10. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from 20% to about 25% by foam volume which range in size between about 0.2 microns to about 10 microns.

11. The horticultural growing medium of claim 1, wherein said foam material has pores ranging from about 25% to about 35% by foam volume which range in size between about 300 microns to about 800 microns.

12. The horticultural growing medium of claim 1, wherein said foam material is substantially sterile.

13. The horticultural growing medium of claim 1, wherein said foam material has pores of about 30% by foam volume which range in size between about 300 microns to about 800 microns.

14. The horticultural growing medium of claim 1 wherein said foam material has a total porosity ranging from 85% to 95%.

15. The horticultural growing medium of claim 1 wherein said foam material has a total porosity of about 90% to 92%.

16. A horticultural growing medium comprising:

a sterile hydrophilic unfilled foam material made of diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity ranging from about 85% to about 95%;

said horticultural growing medium being capable of supporting plant growth.

17. The horticultural growing medium of claim 16, wherein said foam material is at least one diphenylmethane diisocyanate taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and

2,2'-diphenylmethane diisocyanate.

18. The horticultural growing medium of claim 16, wherein said foam material is polymeric diphenylmethane diisocyanate.

19. The horticultural growing medium of claim 16, wherein said foam material is one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, polymeric MDI or a mixture of the same.

20. A horticultural growing medium comprising:

a substantially sterile unfilled foam material made of polymeric diphenylmethane diisocyanate taken from a group consisting of one or more of 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanate (MDI), crude MDI, products of crude diaminodiphenyl methane including polymeric MDI or a mixture of the same, having at least 50 of its pores ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, with a total porosity ranging from about 90% to about 92%,

said horticultural growing medium being capable of supporting plant growth.

21. A horticultural growing medium as claimed in claim 20 wherein said foam material is a sheet with seeds secured thereto.

22. A horticultural growing medium as claimed in claim 20 wherein said foam material is a shaped block with an aperture cut therein.

23. A horticultural growing medium as claimed in claim 20 wherein said cation exchange capacity is about 1.0.

24. (Canceled)

25. A horticultural growing medium comprising:

a hydrophilic, substantially sterile diphenylmethane diisocyanate foam material without filler

material taken from a group consisting of polymeric diphenylmethane diisocyanate, crude diphenylmethane diisocyanate, 4,4'-, 2,4'-, 2,2'-diphenylmethane diisocyanate and having a neutral pH ranging from 6.8 to 7.8, said material having a cation exchange capacity ranging from about 1.0 to about 1.5,

said horticultural growing medium being capable of supporting plant growth.

26. A horticultural growing medium comprising:

a hydrophilic flexible sterile foam material made of diphenylmethane diisocyanate said foam material being taken from a group consisting of crude, polymeric, 4,4'-, 2,4'- and 2,2'-diphenylmethane diisocyanate having at least 50% of its pores by foam volume ranging in size between 10 and 200 microns with a cation exchange capacity ranging from about 1.0 to about 1.5, said foam material having a total porosity ranging from about 85% to about 95%;

said horticultural growing medium being capable of supporting plant growth.

EVIDENCE APPENDIX

There is no evidence to include in this appendix.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings to include in this appendix.